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James Kundart
Pacific University

Yu-Chi Tai
Pacific University

John R. Hayes
Pacific University

Joshua Gietzen
Pacific University

James Sheedy
Pacific University

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Real-Time Objective Measurement of Accommodation While Reading

Description

Purpose: To determine the feasibility of collecting accurate, continuous accommodative data during reading.

Introduction: Both clinicians and researchers alike have seen a need to measure accommodation during reading of continuous text. In the past, obtaining these measures has been hampered by off-axis effects caused by eye movements.

Disciplines

Optometry

Comments

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Real-Time Objective Measurement of Accommodation While Reading

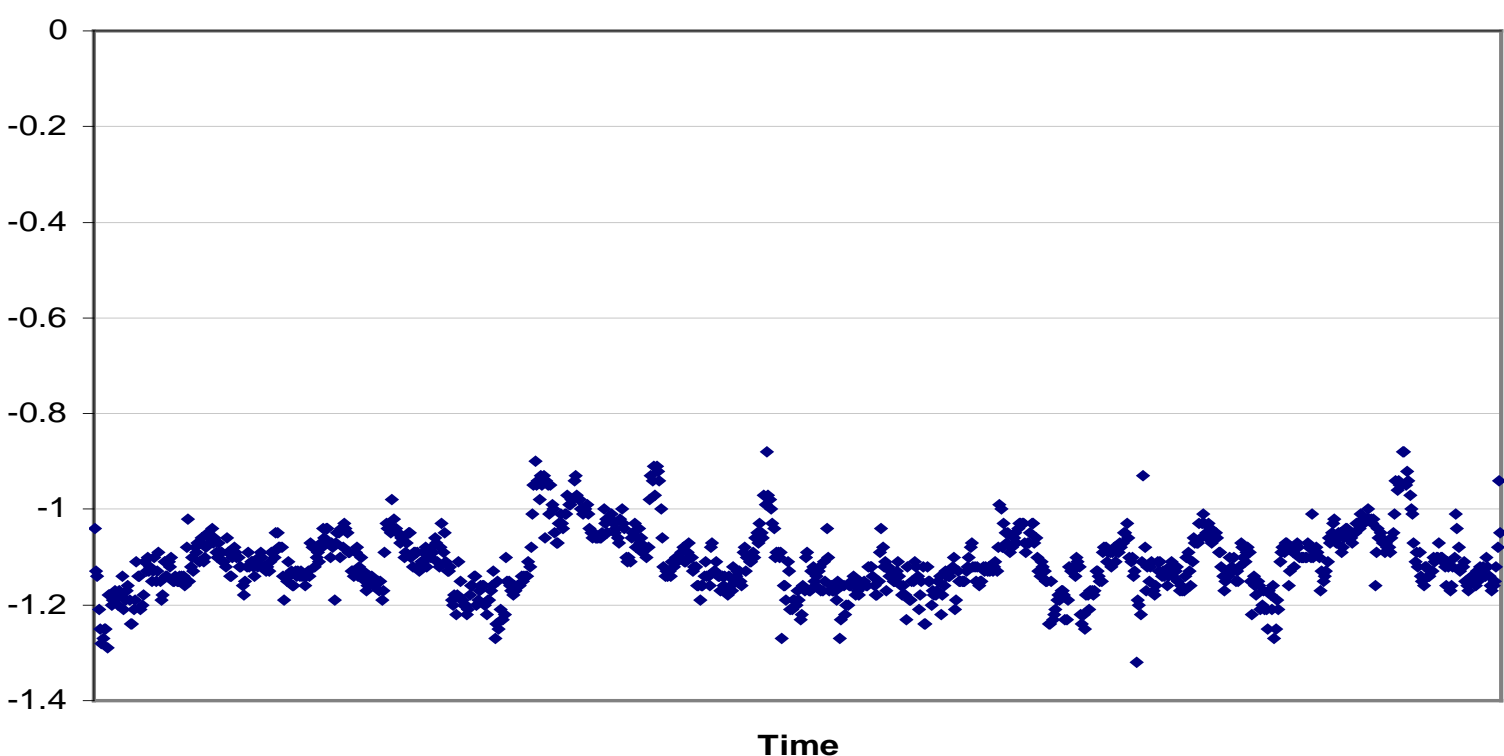
James Kundart, OD, MEd, FAAO, Yu-Chi Tai, PhD, John R. Hayes, PhD, Joshua Gietzen, BS, and James Sheedy OD, PhD, FAAO

Vision Performance Institute, Ergonomics Research Lab, Pacific University College of Optometry, Forest Grove, Oregon

Purpose: To determine the feasibility of collecting accurate, continuous accommodative data during reading.

Introduction: Both clinicians and researchers alike have seen a need to measure accommodation during reading of continuous text. In the past, obtaining these measures has been hampered by off-axis effects caused by eye movements.

Subjects and Equipment: Nine subjects participated in the study (5 females, 4 males, ages 20-38). All wore the proper spectacle or contact lens prescriptions, if applicable. Measurements were taken using the WAM-5500 open-field autorefractor. . When controlling for off-axis effects,, small fluctuations in accommodation are apparent.



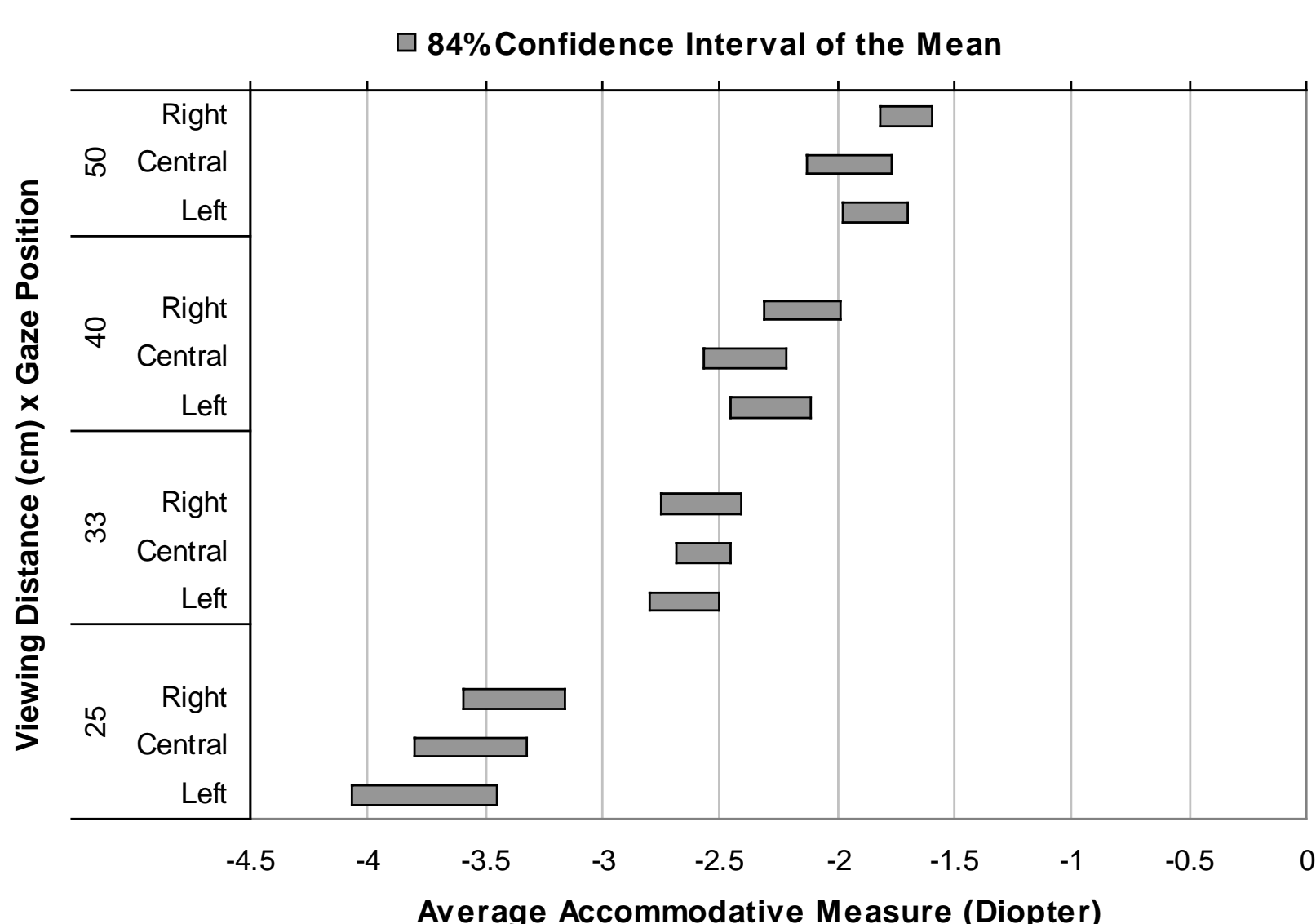
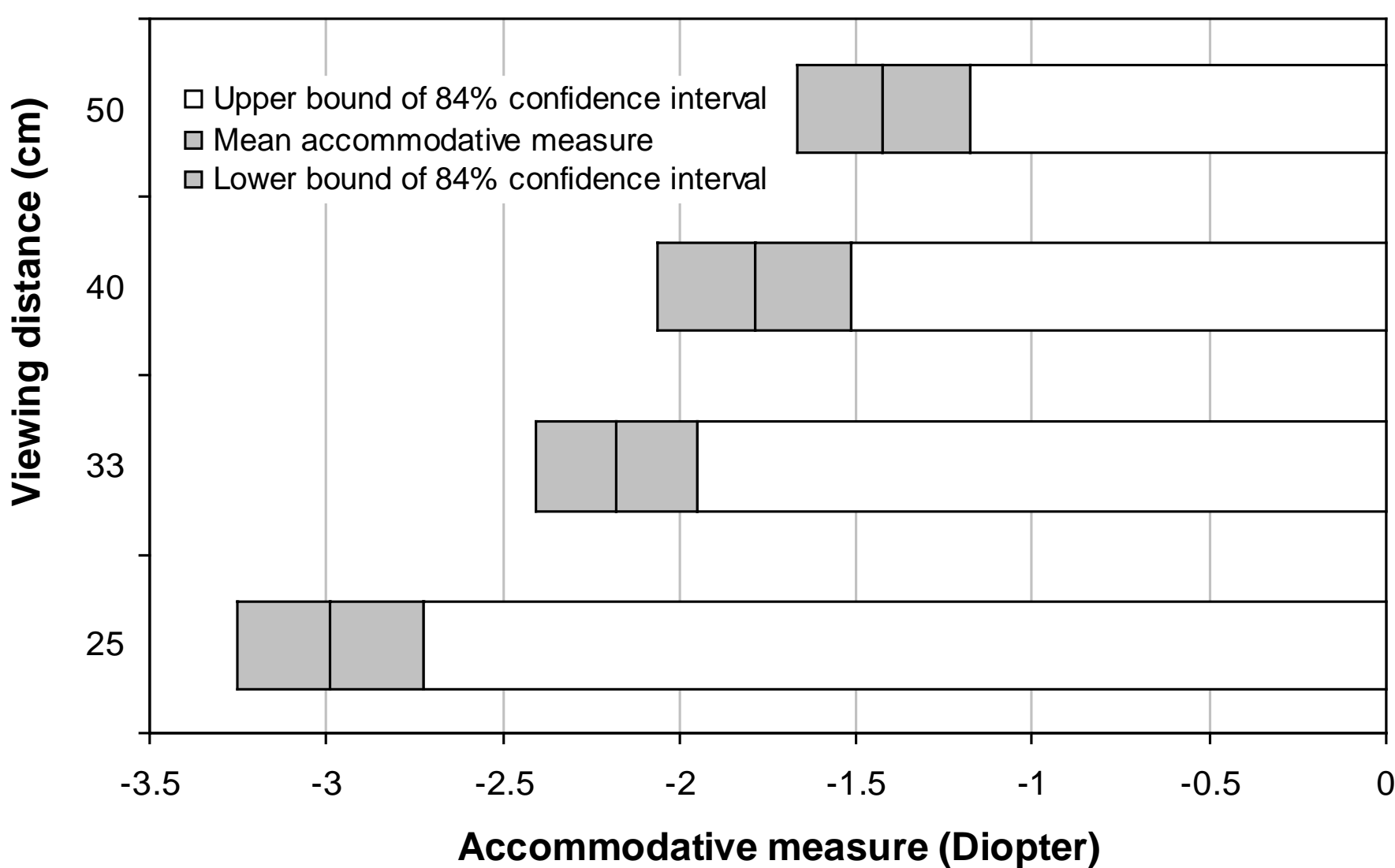
Methods: Using an open-field autorefractor, real-time accommodative measures were gathered on nine subjects (5 female, 4 male). The subjects were asked to read continuous text on three displays while accommodative measurements were collected at 5 Hz. Hard copy, desktop and handheld displays were used at four distances: 50, 40, 33 and 25 cm.



Conclusions: The diagnosis of clinical entities like accommodative insufficiency would benefit greatly from an objective measure of the focusing response during reading. Under the conditions outlined in this study, the Grand Seiko WAM-5500 can obtain this information.

Future Directions: Obtaining objective measures are a step forward in allowing optometric clinicians to make better diagnoses. By defining acceptable blur and allowing for lag, the techniques used in this study could be easily modified to objectively measure accommodative amplitudes for the first time.

Results: Accommodative response, allowing for expected accommodative lag, varied with target distance as expected. The accommodative response was measured within 0.25 D of expected clinical values during reading in a 3-line vertical, 15-degree horizontal window. Measurements outside this window were hampered by off-axis errors or obscured by the lids.



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